

# **Kennedy NASA Policy Directive**

**Effective Date:**        **October 8, 2004**

**Expiration Date:**     **October 8, 2009**

**Responsible Office:** **Spaceport Services**

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## **KSC RADIATION PROTECTION PROGRAM**

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**National Aeronautics and  
Space Administration**

**John F. Kennedy Space Center**

## **1. POLICY**

It is KSC policy to exercise centralized control over the procurement, use, storage, transportation, and disposition of ionizing (e.g., radioactive materials, radiation producing machines) and nonionizing (e.g., radio frequency/ microwave, lasers, ultraviolet, infrared, and visible) radiation sources to ensure compliance with applicable regulatory requirements; and to limit the exposure of personnel, facilities, and the environs to levels which are As Low As Reasonably Achievable (ALARA).

## **2. APPLICABILITY**

This Policy applies to all KSC organizational elements, facilities, geographical areas, and operations under KSC jurisdiction or direction, including civilian and military personnel, prime and subcontractor organizations, tenants, principal investigators, and visitors.

## **3. AUTHORITY**

- a. NASA KSC U.S. Nuclear Regulatory Commission Broadscope Radioactive Materials License #09-11149-03
- b. KNPD 1800.1 (as revised), Environmental Health Program
- c. NPD 1820.1, Environmental Health Program
- d. NPD 8710.2, NASA Safety and Health Program

## **3. REFERENCES**

1. NASA FAR Supplement 1823.70 "Safety and Health"
2. "Nuclear Safety Review and Approval Procedures for Minor Radioactive Sources in Space" Guide, Approved by the Executive Office of the President, National Aeronautics and Space Council, June 16, 1970
3. U.S. Code of Federal Regulations (CFR) Title 10, Chapter 1, (USNRC), Parts 0 - 170
4. U.S. Code of Federal Regulations (CFR) Title 21, Parts 1000 - 1040
5. U.S. Code of Federal Regulations (CFR) Title 29, Parts 1910.26 and 1910.97
6. U.S. Code of Federal Regulations (CFR) Title 49, Parts 173 and 389
7. U.S. Department of Energy (DoE) Minimum Radiological Health and Critically Safety Criteria
8. State of Florida Administrative Code (FAC) Chapter 64E-5, "Control of Radiation Hazard Regulation"

9. 45 Space Wing instruction 40-201 - Radiation Protection Program
10. JHB 2000 (as revised), Consolidated Comprehensive Emergency Preparedness Plan
11. KHB 1700.7 (as revised), Space Shuttle Payload Ground Safety Handbook
12. KNPR 8715.3 (as revised), KSC Safety Practices Procedural Requirements
13. KNPR 1860.1 (as revised), KSC Ionizing Radiation Protection Program
14. KNPR 1860.2 (as revised), KSC Nonionizing Radiation Protection Program
15. KNPB 1150.24 (as revised), Boards, Committees, Working Groups and Panels

#### **4. RESPONSIBILITIES**

1. The Radiation Protection Committee (RPC), as established by KNPB 1150.24, is responsible for:
  - a. Ensuring the development and maintenance of KSC Radiation Protection Program policies and recommending their approval to the Center Director.
  - b. Reviewing and approving the usage of controlled radiation sources (see Attachment B).
  - c. Advising the Radiation Protection Officer in the execution of program duties as defined in KNPB 1860.1.
  - d. Providing oversight of the KSC Radiation Protection Program implementation and maintenance.
2. The Radiation Protection Officer (RPO) is responsible for:
  - a. Providing general surveillance over uses of radiation sources.
  - b. Representing the KSC Radiation Protection Program and the RPC to ensure compliance with applicable regulatory agency requirements, standards, and radiation-related activities.
  - c. Acting as liaison officer between KSC organizations and non-regulatory agencies, parties, contractors, etc., for radiological matters.
  - d. Providing technical guidance to KSC organizations on radiation-related matters.

- e. Auditing the records of the Radiation Protection Program for KSC as necessary.
  - f. Assuming technical control; initiating investigations; and directing corrective actions in radiological incidents and emergencies for KSC; and coordinating mishap reporting and investigation requirements with the KSC Safety and KSC Security Offices, as appropriate.
  - g. Performs contract insight role by participating in the Environmental Health Integrated Product Team, lead by the JPMO, responsible for reviewing and assessing J-BOSC contract performance indicators.
  - h. Representing the RPC and acting for KSC on matters of policy and procedures relating specifically to control of radiation sources for KSC.
  - i. Making interim approvals for the Radiation Protection Committee, subject to subsequent RPC ratification.
  - j. Assuring proper disposition of radiation records for all employees, both Government and contractor, upon their termination of employment or transfer from KSC.
  - k. Advising the Protective Services Branch, Spaceport Services Directorate of the location of major radiation sources. In addition, the contractor Fire Chief receives a quarterly listing of all facilities containing radioactive materials.
3. Heads of primary organizations are responsible for:
- a. Ensuring that all requests for the procurement, use, or transfer of controlled radiation sources (as defined in KNPR 1860.1 and KNPR 1860.2) are coordinated with the RPO for approval, prior to forwarding to the Procurement Officer, Transportation Officer, or other appropriate official.
  - b. Assuring that project leaders, technical representatives, and supervisors:
    - (1) Familiarize themselves with policies and procedures governing radiation sources;
    - (2) Ensure that personnel within their respective organizational responsibility are provided appropriate operational orientation and/or systems training involving uses of radiation sources; and
    - (3) Review their project plans and procedures that involve the use of radiation sources, and identify them to the RPC/RPO.
  - c. Ensuring that Procurement Requests and Statements of Work involving radiation sources (directly or indirectly):

- (1) Identify requirements for Radiation Protection Program compliance;
    - (2) Require all contractor radiation source user personnel who are terminating or transferring employment to be identified in accordance with the use authorization requirements
  - d. Assuring the designation of a user organization/group Area Radiation Officer (ARO). The ARO shall have familiarity with KSC Radiation Protection Program requirements.
4. Area Radiation Officers (AROs) are responsible for:
- a. Ensuring the safe use and accountability of the source(s) under their control in accordance with the provisions specified and approved by the applicable KSC Radiation Use Authorization.
  - b. Ensuring all sources of radiation under their jurisdiction have been identified to, and approved by, the RPO.
  - c. Giving prior notification to the J-BOSC Health Physics Office of movement of controlled radiation sources.
  - d. Ensuring all personnel using sources of radiation under their jurisdiction are properly trained in safe practices for the possession and use of such sources and are oriented to the applicable regulatory requirements; ensuring the individual users have been approved through the Radiation Protection Program.
  - e. Designating an Alternate ARO and/or "Use Supervisor/ Custodian" (US/C) to act as designated representative in their absence, or whenever they are unable to maintain direct supervision of the sources under their jurisdiction; ensuring that the Alternate ARO or US/C has training and experience in radiation protection which is commensurate with the scope of the proposed activities and is satisfactory to the RPO.
5. All personnel engaged in the transportation, handling, storage, and/or utilization of controlled radiation sources are responsible for complying with radiation protection requirements, applicable regulations, and for the prompt reporting of any violation to the RPO.
6. The Safety and Mission Assurance functions within Safety and Mission Assurance, Space Shuttle Processing, International Space Station/Payload Processing, Launch Services Program, Spaceport Engineering and Technology, and Spaceport Services Directorates are responsible for:

- a. Coordinating provisions of the KSC Safety, Reliability, and Quality Assurance Program with KSC Radiation Protection Program provisions or with the KSC Radiation Protection Officer, as necessary.
  - b. Reviewing and monitoring procedures from a safety standpoint involving the use, movement, and transportation of radioactive materials, as required by KNPR 8715.3 or KNPR 8715.2, as appropriate.
  - c. Providing safety surveillance of all activities involving the use of radiation sources as such activities relate to KNPB 8700.1
  - d. Coordinating with the RPO on emergency operations concerning radiation sources.
  - e. Supporting enforcement of radiological controls established by the KSC Radiation Protection Program.
7. The Director of Spaceport Services is responsible for ensuring the following functions:
- a. The Chief, Facilities Division is responsible for ensuring requests for construction or modification of facilities in which radiation sources are intended to be stored, tested, or used are approved through the KSC Radiation Protection Program.
  - b. The Emergency Preparedness Planning Officer will:
    - (1) Coordinate with the RPO, or designated representative, on the development of emergency plans and procedures for major emergency situations involving radiation sources that might significantly affect KSC operations or personnel safety.
    - (2) Coordinate KSC resources to support implementation of approved emergency plans and procedures, as directed by the RPO, for radiation sources.
  - c. Lead, Fire/Rescue will ensure fire protection personnel are properly trained in personnel protective practices for fighting fires involving radiation sources.
  - d. The Chief, Supply, Equipment, Transportation and Center Support Branch will:
    - (1) Ensure outbound shipments of radioactive materials from KSC comply with applicable regulations and have been approved by the RPO, or designated representative.

- (2) Ensure receipts of radioactive materials are identified to, and approvals are received from, the RPO, or designated representative, for disposition.
  - (3) Ensure that controlled radiation sources are not released from KSC by the Property Disposal Office without approval of the RPO or designated representative.
8. The Director, Procurement Office, is responsible for:
- a. Ensuring procurement requests, for material or equipment that produces or contains sources of radiation, have been identified to the RPO prior to procurement.
  - b. Incorporating into all Requests for Proposal and Invitations for Bid (to include KSC Form 7-49, "Request for Equipment/Materials") all radiation protection requirements identified by the heads of primary organizations in their Purchase Requests or Statements of Work.
  - c. Ensuring contractor compliance with the requirements of the KSC Radiation Protection Program.
9. The Director, External Relations Directorate, is responsible for coordinating public affairs activities involving radiation sources with the RPC or the RPO.
10. The Human Resources Office is responsible for ensuring all NASA/KSC and civil service tenant employees who have been classified as radiation workers and are terminating or transferring employment have cleared through the Occupational Medicine and Environmental Health Facility.
11. Contracting Officers are responsible for including in all contracts the requirement the contractor ensures their personnel who have been classified as radiation workers and are terminating or transferring employment clear by telephone through the Occupational Medicine and Environmental Health Facility.

## **5. CANCELLATION or SUPERSESION**

This KNPD cancels and supersedes KMI 1860.1, KSC Radiation Protection Program.

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Director

Attachment A: Provisions

Attachment B: Radiation Protection Program Summary

Distribution: Tech Doc Library

Attachment A - PROVISIONS

Activities involving ionizing and nonionizing sources will be centrally controlled under the provisions of the KSC Radiation Protection Program to restrict exposure of personnel and the environs to levels which are as low as reasonably achievable (ALARA) and to ensure consistent regulatory compliance. All activities involving radiation sources will be subject to the concurrence of the KSC Radiation Protection Committee (RPC), which will review such activities and levy suitable constraints through the RPO. Radiation sources will be identified to the KSC Radiation Protection Officer (RPO) for appropriate review and evaluation. No radiation source will be considered exempt from control requirements unless so designated by the RPO or by guidelines provided by the RPC or Radiation Protection Program documents. The following general provisions are provided as guidance to the requirements of the program. Specific requirements, controls, and guidelines are provided in KNPR 1860.1 (Ionizing radiation) and KNPR 1860.2 (Nonionizing radiation).

1. Requests for review and approval of all activities involving radiation sources will be submitted to the RPC through the RPO.
2. Designated original KSC forms will be used by the requester for all submittals to the RPO.
3. All receiving, internal transfer, shipping and disposal of controlled radiation sources will be coordinated in advance with the RPO or designated representative for review and approval. Organizational elements responsible for such activities will review their plans and procedures to ensure required coordination are accomplished.
4. In addition to basic regulatory requirements, the RPO may include additional requirements as deemed appropriate.
5. Applicable records pertaining to the KSC Radiation Protection Program will be maintained by the RPO or designated representative. Records of approved Use Authorizations will also be maintained by the user organization involved.
6. Personnel who enter a defined Radiation Area will be appropriately monitored to identify and assess potential exposures.
7. Specific exemption or waiver of program control requirements may be issued only by the RPO, after appropriate review and evaluation, and only on an individual case basis.
8. A copy of this Instruction will be readily available to users in each area that has been authorized as a place of use or storage of radiation sources.
9. Specific provisions and requirements of the KSC Radiation Protection Program are described in KNPR 1860.1, "KSC Ionizing Radiation Protection Program" and in KNPR 1860.2, "KSC Nonionizing Radiation Protection Program." These KNPRs include information regarding the review, approval, or exemption process, licensing and registration of radiation sources, leak testing, inspections



and surveys, program responsibilities and definitions, shipping and receiving procedures, emergency notification requirements, and incident investigations.

10. The health physics element of the J-BOSC Occupational Medicine and Environmental Health Services will, to the extent provided by contract, provide services to include:
  - a. Operational implementation of the KSC Radiation Protection Program as required by the Statement of Work.
  - b. An individual to act on behalf of the RPO in the RPO's absence and after formal notification by the RPO.
  - c. Preparation of licensing and registration applications for NASA/KSC and maintenance of those licenses/ registrations with associated records and reports in accordance with applicable regulatory agencies' requirements
  - d. General surveillance functions for the KSC Radiation Protection Program.
  - e. Evaluation of uses of radiation, recommendations, and technical assistance to the RPO on matters concerning radiation protection for KSC.
  - f. Acting as the field representative for the KSC Radiation Protection Program and as liaison between user organizations and the RPO on radiological matters.
  - g. Performance of onsite surveillance and inspection surveys/audits of radiation use and users.
  - h. Evaluation of uses of radioactive material for determination of waste handling/processing/disposal requirements in accordance with the KSC Radiation Protection Program.

## Attachment B - RADIATION PROTECTION PROGRAM SUMMARY

1. KSC's Radiation Protection Program is based on three fundamental principles: (1) centralized and uniform control and enforcement; (2) compliance with applicable regulations, standards, and guides; and (3) elimination or minimization of personnel exposures to levels that are below regulatory limits and are as low as reasonably achievable (ALARA). These basic principles are documented in the Program's Management Issuances, KNPD 1150.24 and KNPD 1860.1, and KNPR 1860.1 and KNPR 1860.2. The documents emphasize the administrative implementation of these principles through the authorities, responsibilities, and functions of the Program's three major elements represented by the KSC Radiation Protection Committee (RPC), the KSC Radiation Protection Officer (RPO), and the KSC Contractor Health Physics Office (HPO). The documents also prescribe, by reference, the current and latest versions of relevant regulations, standards, and guides, and are always applicable to current usage. It should be noted that only limited portions of these regulations, selected for the reader's information, are reproduced in the Program documents.

2. Implementation of the Program relies heavily on the Radiation Use Request/Authorization process. This process involves the submittal of specific information by the prospective user, review of the information for applicable requirements, assessment of the potential hazards involved, the imposition of specific controls and provisions, and the issuance to the user of a final, comprehensive Use Authorization package incorporating and documenting all elements of approved radiation source use and possession. Specific Use Authorization packages expire after one year. Annual extensions, as well as other revisions/changes to the original package, can be obtained through the review and approval of a Modification Request submitted by the user.

3. In effect, the overall Radiation Use Request/Authorization process can be viewed as a quasi-licensing process that requires case-by-case review, evaluation, and approval of each radiation source use. Following the guidance provided in KNPR 1860.1 or KNPR 1860.2, the prospective user assembles a Use Request package utilizing standardized KSC Forms and incorporating other required data/information. This package is then submitted to the J-BOSC Health Physics Contractor for a thorough in-depth review.

4. The Health Physics review of the package includes a comprehensive evaluation of the radiation source characteristics, the handling, storage, and emergency procedures, the associated area, facilities, and equipment, and user personnel qualifications. These elements are reviewed for Program conformance, regulatory compliance, and the potential radiation hazards involved. As a result of this review, Health Physics develops a set of tailor-made administrative, engineering, and procedural control requirements that are documented and incorporated into the package together with their recommendation regarding approval.

5. The RPO then conducts a review of the Use Authorization package as received from Health Physics. Acting on behalf of the Program and as functional representative of the RPC, the RPO will approve, modify, or reject the package. When approved, the package is signed off by the RPO and forwarded to the RPC Chairman for review. Again, acting on behalf of the Program and the Committee, the RPC Chairman will approve, modify, or reject the package as received from the RPO. When approved, the official Use Authorization package is signed off by the RPC Chairman and is returned

back to the J-BOSC Health Physics Contractor for distribution. For Use Authorization packages involving U.S. Air Force programs or Cape Canaveral Air Force Station (CCAFS) locations, the 45th Space Wing Radiation Protection Officer also approves the package. Use Authorizations that have been approved and signed off by both the RPC Chairman and the RPO are reviewed and acted upon by the RPC membership at its next regularly scheduled quarterly meeting. These approval actions are documented in the minutes to the quarterly RPC meeting.